REMARKS

In the Office Action dated July 1, 2002, claim 3 was objected to under 37 C.F.R. §1.75(c) as being of improper dependent form. Claim 3 has now been made to depend from claim 8 (in view of the cancellation of claim 1) and has been revised to be consistent with the language of claim 8. Claim 3 is therefore in full compliance with 37 C.F.R. §1.75(c).

Claims 1-4, 6, 8, 10-15, 17, 18 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Tanaka in view of Kroener. Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Tanaka in view of Kroener, further in view of Deucher et al.

Claims 16, 19 and 21 were stated to be allowable if rewritten in independent form. In view of Applicant's belief that the independent claims from which those depended claims respectively depend are patentable over the references relied upon by the Examiner, those have claims have been retained in dependent form at this time.

The above rejections are respectfully traversed for the following reasons.

Each of the independent claims remaining in the application (claims 8, 17 and 20) claims a first heat exchanger and a second heat exchanger disposed in a thermally conductive path relative to the first heat exchanger. The first heat exchanger is stated to transfer heat from an x-ray source to the second heat exchanger.

The Examiner relied on the Tanaka reference as teaching an x-ray examination arrangement for computed tomography having an x-ray source rotatable around an axis with a heat exchanger in thermally conductive communication therewith, the heat exchanger also being rotatable around the rotational axis. The

Examiner acknowledged that the Tanaka reference does not specifically disclose a gantry with a second heat exchanger disposed in a thermally conductive path with the aforementioned heat exchanger as a first heat exchanger, wherein the first heat exchanger transfers heat from the x-ray source to the second heat exchanger. The Examiner also acknowledged that the Tanaka reference does not teach an arrangement having such a secondary heat exchanger that is stationary relative to the first heat exchanger.

The Examiner relied on the Kroener reference as teaching a computed tomography apparatus having a gantry with two heat exchangers 27 in thermal communication therewith. The Examiner stated it would have been obvious to a person of ordinary skill in the art to employ the second heat exchanger components and the gantry in the Kroener reference with the device of Tanaka.

In proposing this modification and in concluding that such a modification would have been obvious to a person of ordinary skill in the art, Applicants respectfully submit the Examiner has not considered all of the teachings of the Kroener reference, but has only considered (or cited) a selected portion of the overall teachings in a manner so as to allegedly substantiate the Examiner's rejection. In reality, however, a person of ordinary skill in the art, who has not had the benefit of reading Applicants disclosure, has no reason to be so selective as to which of the teachings of Kroener to employ and which to reject. More importantly, however, due to the physical structure of the Kroener reference, it is not possible to employ only those structural features relied upon by the Examiner, while ignoring the other equally relevant structural features. It is those other relevant structural features which physically preclude the structures in Kroener relied upon by the Examiner from being combined with the device disclosed in the Tanaka reference.

Applicants recognize that in order to substantiate a rejection under 35 U.S.C. §103(a) it is not necessary that components of a secondary reference be physically combinable into components of a primary reference. Nevertheless, Applicants respectfully submit it is incumbent on the Examiner to propose a combination for which there is a reasonable expectation that it could actually be constructed. Given the structural limitations in the device disclosed in the Kroener reference, Applicants respectfully submit a person of ordinary skill in the art would be dissuaded from modifying the Tanaka reference in accordance with the teachings of Kroener, rather than finding such a combination to be obvious.

The computed tomography apparatus disclosed in the Kroener reference has a live ring 3, at which the x-ray source and the radiation detector are mounted. The live ring 3 and the stationary part 2 of the tomography apparatus form a sealed annular channel 14. A conduit 16, connected to the live ring 3, is disposed in this sealed annular channel 14. The conduit 16 has a coolant flowing therein, and transfers heat generated by the x-ray source to the heat exchanger 9. A gaseous coolant is contained in the sealed annular channel 14, which receives the heat from the conduit 16. The stationary part 2 of the tomography apparatus is provided with inlet openings 25 and outlet openings 24 that are connected to one another. Thus, the sealed annular channel 14, the inlet openings 25 and the outlet openings 24 form a closed circulation loop in which the gaseous coolant flows. One heat exchanger 27 is arranged between one inlet opening 25 and one outlet opening 24, this heat exchanger 27 eliminating the heat of the gaseous coolant into the ambient surroundings. The same is true of the other heat exchanger 27. The two heat exchangers 27 are each connected to lines 28 and 29, but these lines merely serve

to allow coolant to be supplied to and taken from the heat exchangers 27, and do not provide thermal communication between the two heat exchangers 27.

The computed tomography apparatus disclosed in the Kroener reference thus has no annular, stationary heat exchanger, but instead has two heat exchangers 27 disposed around the stationary part 2 of the computed tomography apparatus. Because of the specific structure of the tomography apparatus disclosed in the Kroener reference, having the aforementioned sealed annular channel 14 with inlet openings 25 and output openings 24, there is no reason or motivation why a person of ordinary skill in the art would rely on the Kroener as a basis for a modification of the Tanaka reference to provide a first annular heat exchanger which is arranged at the gantry and which thermally interacts with a second, annular, stationary heat exchanger.

Therefore, neither the Tanaka nor Kroener references discloses all of the elements of any of independent claims 1, 17 and 20. Not only is there no teaching or motivation or inducement for a person of ordinary skill in the art to modify the Tanaka reference in accordance with the teachings of Kroener, even if this were done an apparatus as disclosed and claimed in the present application still would not result. Independent claims 8, 17 and 20, therefore, would not have been obvious to a person of ordinary skill in the art based on the teachings of Tanaka and Kroener.

As to claim 7, in view of the aforementioned deficiencies of the Tanaka/Kroener combination, even if that combination were further modified in accordance with the teachings of Deucher et al, a device as set forth in claim 7 still would not result, since claim 7 embodies the subject matter of claim 8 therein.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

Submitted by,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Cancel claims 1 and 2.

Claim 3 has been amended as follows:

3. (Amended) The improvement of claim [1] 8 wherein said first heat exchanger comprises at least one heat exchange element.

Claim 4 has been amended as follows:

4. (Amended) The improvement of claim [1] 8 wherein said heat exchanger has a flow path therein, and further comprising a heat transfer medium flowing through said first heat exchanger in said flow path.

Claim 6 has been amended as follows:

6. (Twice Amended) The improvement of claim [1] 8 wherein said first heat exchanger comprises at least two heat exchange elements, and, further comprising a covering proceeding circumferentially around said rotational axis and disposed between said at least two heat exchange elements.

Claim 7 has been amended as follows:

7. (Amended) The improvement of claim [1] 8 wherein said heat exchanger is rotatable around said rotational axis together with said gantry, and further comprising a plurality of annular guide devices disposed at said heat exchanger and conducting an airstream, generated by rotation of said heat exchanger and heated at said first heat exchanger and at said second heat exchanger, away from said gantry toward an exterior of said gantry.

Claim 17 has been amended as follows:

17. (Twice Amended) A computed tomography apparatus comprising:

a gantry rotatable around a rotational axis;

an X-ray source and an X-ray detector mounted opposite to each other on said gantry, said X-ray source emitting heat during operation thereof; [and]

a first ring-like heat exchanger disposed at said gantry having at least two heat exchange elements thermally conductively connected to each other, with at least one of said heat exchange elements being thermally conductively connected to said X-ray source for transferring said heat from said X-ray source; and

a second heat exchanger disposed in a thermally conductive path relative to said first heat exchanger for transferring heat from said first heat exchanger to an exterior of said gantry.

Cancel claim 18.

Claim 19 has been amended as follows:

19. (Amended) A computed tomography apparatus as claimed in claim [18] 19, wherein said first heat exchanger is rotatable around said rotational axis together with said gantry, and further comprising a plurality of inter-engaging annular guide devices for guiding an airstream, generated by rotation of said first heat exchanger and heated at said first heat exchanger, from said first heat exchanger to said second heat exchanger.